

EPELETIA CAYETANA (Cuatr.) Cuatr. nov. status.

Epeletia grandiflora var. cayetana Cuatr. Phytologia 32:323.1975.

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STUDIES IN NEOTROPICAL SENECIONEAE III.
NEW TAXA IN SENECIO, PENTACALIA AND GYNOXYS

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SENECIO HANSWEBERI Cuatr. sp. nov.

Herba rhizomatosa caule lignoso argute nodoso prostrato semi-subterraneo repente plagiotropo cum radicis numerosis subteneris carnosulis geotropis et ramulis brevibus rosulas paucifoliatas terminales gerentibus.

Folia rosularia 9-20 cm longa 4-8 mm lata sessilia. Lamina carnosulo-coriacea rigida oblanceolato-linearis subite acutata marginibus argute revolutis aspectu integerrima basin versus paulo attenuata, adaxiale in adultis viridissima laevis glabra tantum linea mediali plus minusve impressa, abaxiale costa elevata sicut marginibus retortis viridibus glabrisque ceterum plana alba densissima adpresseque lanata infra indumentum enervia superficie laevi; basis laminae in vaginam ampliata. Vagina membranacea viridula glabra parallele nervata circa 3 cm longa basi ad 8-9 mm lata valde amplectenti.

Caulis florifer terminalis bene foliatus robustiusculus fistulosus striatus rigidus erectisque ad 30 cm longus purpurascens subglaber tantum pilis albis tenuissimis longissimis araneosis dilutis denique deciduis, copiose foliis alternis rosularibus similibus sed sursum gradation brevioribus, medialis ad 12 cm longis superme 6-4 cm x 3-2 mm omnibus ad basim ampliatis vaginantibus amplectentibusque. Pars distalis fertilis 5-10 cm longa corymbiforme ramosa, ramis alternis proximalibus 8-10 cm longis vel longioribus 2-3 capituliferis sursum gradatim brevioribus plerumque monocephalis, pedunculis 1-2 cm longis vel longioribus striatis rigidis erectisque. Bracteae subtendentes inferiores folia suprema similes 30 x 2-3 mm, lanceolatae sursum minores lineares acutae in pedunculis copiosae, supremae 10-8 x 1-0.6 mm subimbricatae in calyculum gradatim mutantes.

Capitula erecta radiata cylindraceo-campanulata 14-18 mm alta 9-12 mm diametro, circulo ligularum 25-30 mm diam, 137-143 flores ferentia. Calyculus 8-10 bracteolis lineari-lanceolatis acutis 6-9 x 1.0-1.6 mm, herbaceis crassiusculis viridibus sursum plus minusve purpureis glabris (vel marginibus parvis pilis 0.1-0.2 mm)

pluriseriatis imbricatis interioribus involucrem fere attingentibus exterioribus cum bracteolis pedunculi numerosis gradatim subimbricatis. Involucrem cylindraceo-campanulatum circa 11 mm altum, 21 phyllariis aequilongis subuniseriatis crasse herbaceis firmulis 9-10 mm longis lineari-lanceolatis acutis glabris apice minute ciliato excepto inferne viridibus sursum purpuraceis, alternatim exterioribus, 1.2-1.5 mm latis interioribus anguste scarioso-marginatis 2-2.3 mm latis. Receptaculum planum 5-6 mm diam nudum glabrum leviter alveolatum.

Flores radii feminei ligulati 13-14 in capitulo. Corolla lutea 15-18 mm longa, tubo angusto 4-5 mm longo praecipue sursum sparse vel copiose piloso pilis 0.2-0.3 mm crassis sed debilis hyalinis pluricellularibus flexuosis obtusissimis usque ad clavatis; lamina 10-13 x 3.5-5 mm elliptica apice obtusa minuteque 3-denticulata, 5-7 nervis plerumque aurantiacis valde notatis utrinque glabra. Stylus 6-7 mm ramis strictis 2.5-2.7 mm apice convexo dense papilloso papillis obtusis, lineis stigmaticis adaxiali-marginalibus crassiusculis fere conniventibus, basi bulbosis cellulis subquadratis pluristratosis.

Flores disci hermaphroditi 123-129 in capitulo. Corolla lutea 7-9 mm longa glabra, tubo 4-5 mm longo, limbo tubuloso sursum gradatim leviterque dilatato 5 dentibus triangularibus crassiuscule marginatis apice paulo papillosis 0.6-0.8 mm altis. Antherae 2.5 mm longae basi obtuse auriculatae appendice apicali oblongo-elliptica obtusa 0.3-0.35 mm longa. Cellulae endotheciales in parietis lateralibus noduliferis. Collum crassum 0.6 mm longum quam filamento crassius deorsum lageniforme incrassatum. Stylus 8-8.5 mm longus basi semi-bulboso-dilatatus, ramis 1.5 mm strictis apice subtruncato convexo, lineis stigmaticis adaxiali-marginalibus crassiusculis subconniventibus.

Achaenia oblonga leviter compressa circa 2.5 mm longa 0.8 mm lata apice obtusa truncata cum annulo pappifero incrassato, costis 10 minute substrigosis pilis gemini-cellulatis, crassiusculis obtusiusculis 0.1-0.15 mm rectis antrorso-patentibus. Pappus albus 6-8 mm longus pilis biseriatis strictissimis minute strigulosis jam caducis.

Typus: Costa Rica: Chirripó-Massiv, Valle de Las Lagunas am Ostüfer der Laguna Grande in einer Moos-Felsschotter-Gesellschaft, 3400 m 18 Mar 1971, Heinrich Kuhbier 0439; holotypus US. Pico Sureste, Chirripó massif 3500-3700 m, leaves glabrous above white below, rays gold and yellow, 9 Dec 1966, A.S. Weston 3607; paratype, US. Near main ridge, Chirripó massif, wet NE slope of Pico de Uran, above lakes, 5 Feb 1981; A.S. Weston 12313 (US). Cerro Chirripó, treeless paramo SW around summit 10,000-12,600 ft, occasional, terrestrial along watercourses, Aug 1967, Evans, Lellinger & Bowers 155 (US).

Senecio hansweberi is closely related to the Andean species of sect. Culcitioides Cuatr. which group should be redefined including glabrous species with leaves with revolute margins (e.g. *S. supremus*, *S. timidus*); the new species can be included in subsection *Radiati* Cuatr., with *S. comosus* Schultz B. ex Wdd. of Peru as the closest species. *S. hansweberi* differs from the Peruvian species by being smaller, and having smaller, narrower and stiffer leaves, erect

flowering branches and pedicels, smaller bracts and bracteoles multibracteolate pedicels and pubescent achenes with geminate trichomes. It is vegetatively very close also to *S. culcitioides* from Ecuador and *S. summus* from Colombia, but both of these are larger plants with larger leaves, having discoid capitula and glabrous achenes.

S. hansweberi adds to the long list of Costa Rican paramo endemics. The species is named for Dr. Hans Weber who first mentioned this *Senecio* as an element of the paramo flora of Costa Rica and published an excellent photograph of it in its natural habitat with the following legend "Abb. 70. Noch nicht bestimmter *Senecio* in den Felsspalten des Chirripo grande" (Weber 1958). Dr. Hans Weber is to be commended for his excellent work on the ecology and phytogeography of the Costa Rican paramos and his first-hand comparative study with the Andean paramos. Most important is his contribution to the paramo plant life in his fundamental work on the anatomy and morphology of the *Espeletia* growth form (caulirosula) with an especially meticulous histogenetic study of its apical meristem.

SENECIO KUHBIERI Cuatr. sp. nov.

Herba rosulifera copiose stolonifera. Stolones dense adpresseque lanati rosulam terminalem et caulem floriferum terminalem effe-rentes. Folia rosularia petiolata. Lamina carnosulo-coriacea rigidula anguste lanceolata vel elliptico-lanceolata apice acute attenuata basi plus minusve gradatim cuneata, 4-16 cm longa 0.8-1.7 cm lata, margine minute mucronato-denticulata et anguste revoluta, adaxiale juvenilis tenuiter adpresseque albo-lanuginea adulta glabra viridis vel plus minusve brunnescens nitida leviter bullata depresso nervata costa profunde impressa nervis secundariis 10-12 utroque latere curvato-ascendentibus impressis tertiis obliquis minus notatis, abaxiale albo-lanata, costa prominentissima cum velo sericeo adpresso tecta, superficie indumento albo-lanato denso adpresso munito, infra vestimentum nervis secundariis bene prominentibus, nervis minoribus prominulis laxe reticulatis. Petiolus 5-10 cm longus argute striatus adpresse lanatus vel lanuginosus in foliis vetustis plus minusve glabratis. Vagina 1-2 longa basi ad 10 mm lata amplexens, adaxiale glabra extus adpre-sissime lanato-sericea.

Rami floriferi terminales ad 50 cm alti vel ultra, tenues sed rigidi striati fistulosi plus minusve purpuracentes et dilute adpre-sses lanuginosi denique plus minusve glabrati, moderate foliati, foliis sparsis alternis parvis inferioribus prope basim petiolatis rosularis similibus, ceteris sessilibus lanceolatis acutis basi dilatato-cordatis amplexentibus, proximalis 9 x 0.8 cm sursum gradatim brevioribus bracteiformibus supremis infra inflorescentiam 3-2 cm x 3-2 mm, omnibus textura foliorum basium similibus. Inflorescentia corymbosa 4-10 capitulis, ramis et pedunculis teneris striatis gracilibus ascendenti-erectis purpurascensibus et arachnoideo-lanugineis ultimis 20-30 mm longis ad modum peduncu-lorum, bracteolis alternis numerosis lanceolatis vel subulatis

10-5 mm longis.

Capitula radiata tereti-campanulata circa 13 mm alta 9-10 mm lata 66-80 flores ferentia circulo ligularum 30 mm diametro. Calyculus 7-9 bracteolis 4-5 x 0.6-0.7 mm herbaceis viridibus lineari-subulatis acutis glabris sed apice minute ciliato, interioribus tantum 1/3 vel 1/2 involucrium attingentibus. Involucrium cylindricum circa 10 mm altum 7-9 mm diam, phyllariis 21 herbaceis viridibus lineari lanceolatis costa crassiuscula praecipue ad basim 9.5-10 mm longis, externis angustis 1 mm latis internis scarioso-marginatis circa 1.8 mm latis, dorso glabris apice penicillato-ciliato pilis papillosis elongatis crassiusculis obtusis supremis hyalinis ad 0.4 mm longis. Receptaculum planum 4 mm diam nudum glabrum leviter alveolatum.

Flores radii feminei ligulati 12-14 in capitulo. Corolla lutea 18-21 mm longa, tubo angusto 5 mm longo prope apicem paulo dilatato abaxiale parvis pilis crassis biseriatim pluricellulatis flexuosis 0.2-0.4 mm longis; lamina elliptico-oblonga 13-18 x 3-3.5 mm obtusa 3 dentibus minutis obtusis apice papillosis plerumque 5 nervis bene conspicuis, utrinque glabra adaxiale leviter mamillato-papillata. Stylus 7 mm longus, basi bulbosa cellulis quadratis pluristratis, ramis strictis 1.5-1.8 mm apice truncato-convexo papilloso lineis stigmaticis adaxiali-marginalibus crassiusculis fere conniventibus. Ovarium 2.8 mm longum oblongum laeve glabrum. Pappus 7-8 mm longus albus pilis strigulosis biseriatis.

Flores disci hermaphroditi 54-66 in capitulo. Corolla lutea 8.5-9 mm longa glabra, tubulo 4 mm longo, limbo tubuloso sursum paulo dilatato, dentibus 5 triangularibus 1 mm altis margine incrassato apice breviter papillosis linea mediale aurantiaca plus minusve conspicua. Antherae 2.5 mm longae basi obtusiuscule auriculatae, appendice oblonga 0.35 mm longa. Cellulae endotheciales oblongae parietibus lateralibus noduliferis. Grana pollinica 0.035 mm. Collum 0.3-0.5 mm longum cellulis quadratis quam filamento crassius basim plus minusve dilatatum Stylus basi semibulbosus ramis 1.6-2 mm longis apice convexo papillato papillis obtusis proximalibus longioribus coroniformibus lineis stigmaticis late crassiusculis approximatis. Ovaria 2.8-3 mm leviter compressa glabra laevia vel sublaevia, apice obtuso annulo crasso pappifero et sicut pappus illa radii similia.

Typus: Costa Rica: Cordillera de Talamanca, Chirripó massif, Tal des Rio Talari in Hoehe der Felsbarre, auf Bloekken zu beiden Seiten des Wasserfalles, 3400 m, 15 Mar 1971, Henrich Kuhbier 0381; holotypus, US. On boulder ridge between Cerro Chirripó and Cerro Nudo, heads radiate yellow without fragrance, occasional, 9 Feb 1981, A.S. Weston 12351; paratype US.

Senecio kuhbieri is another endemic of Costa Rican paramos and a unique species in the genus. It differs from *S. hansweberi* by its weaker, stoloniferous habit with few-leaved rosettes, long-petiolate leaves, rather thin somewhat in zigzag becoming glabrate flowering stems, slender pedicels, fewer number of flowers, longer ray-corollas, and glabrous ovaries. It also may be placed in the subsect. Radiati of Sect. Culcitioides, being easily distinguished

mostly by the above mentioned features from the other species of the subsection.

PENTACALIA GUADALUPE subsp. *CAUCANA* Cuatr. ssp. nov.

Arbuscula circa 2.5 m alta. Rami ramuli ramusculique dense ferrugineo-tomentosi, trichomatibus ramentaceis polymorphis plerumque triangularibus basi late ampliatis sursum acuminatissimis acutis longitudinaliter argute lineatis circa 3 mm longis flexuosis intricatisque.

Folia alterna rigide coriacea petiolata. Lamina 3-5 x 1.6-2.2 cm elliptica basi obtusissima apice breviter attenuata mucronulata, margine visu integra sed valde revoluta sparsis dentibus minutis callosis subtus occultis; adaxiale atroviridis, in sicco brunnescens, nervato-rugosa nitida, juvenilis puberulenta pilis minutis flexuosis copiosis subadpressis adulta glabrescens, costa nervisque secundariis impressis minoribus plus minusve depressis; abaxiale dense ferrugineo-lanata pilis valde tenuibus crispis intricatis tecta et ad costam additionalibus ramentis intermixis; infra indumentum nervis secundariis 6-7 utroque latere valde prominentibus robustisque subpatentibus, nervis minoribus laxe reticulatis parum prominulis. Petiolus robustus 8-14 mm longus ramentosus.

Inflorescentiae terminales corymbiforme paniculatae folia paulo excedentes, 5-12 cm latae, densae floribundae, ramis ramulisque, dense ferruginoso-tomentosis indumento ramentaceo. Bractee proximales foliaceae sed minimae, mediales et distales breves lineari-lanceolatae 8-5 x 1-0.6 mm. Pedicelli breves vel brevissimi capitulis subsessilibus 0.5-5 mm longi ramentis angustioribus densiuscule tecti.

Capitula discoidea cylindracea 10-11 mm alta circa 6 mm diametro. Involucrum 8-8.5 mm altum purpureo-brunnescens (in sicco). Phyllaria 8 subuniseriata crasse herbacea carnosula rigidula, exteriora oblonga apice acute attenuata 6.5-7 x 1.5-1.6 mm, interiora oblongo-elliptica acutata margine late scarioso eroso-ciliolato 6.5-7 x 2.6-3 mm, omnia nitida glabra vel juvenilia praecipue inferne sparsis pilis longis tenuibus flexuosisque, ad apicem abaxiale obtusi-papillosa apice ciliato, dorso obtuse 4-5-nervata. Receptaculum planum 2.2 mm diam leviter alveolatum nudum sed aliquando 1-2 squamis minutis 0.5 mm longis. Calyculum involucri valde brevius 6-8 bracteis lineari-lanceolatis 2-3-seriatis 3-5 x 1-1.3 mm dilute ferruginoso lanugineis.

Flores omnes hermaphroditae, 19-22(-24) in capitulo. Corolla lutea tubulosa 7 mm glabra, tubo angustiori 2.2-2.5 mm longo, limbo tubulari-campanulato sursum gradatim leviterque dilatato, lobis oblongo-triangularibus 1.2-1.3 mm longis marginibus crassioribus, apice subcucullato-incrassato praecipue adaxiale conspicue papilloso. Antherae 2.2 mm longae basi caudatae appendice apicali oblongo-elliptica 0.3 mm longa, cellulis endothecialibus in parietis lateralis seriati-noduliferis. Collum lageniformi-

dilatatum 0.5 mm longum cellulis subquadratis conspicuissimis. Stylus 7.5 mm, ramis 2 mm longis arcuatis adaxiale lineis duobus stigmaticis late incrassatis fere conniventibus, apice attenuato papilloso-pilosulo papillis obtusis ad 0.1 mm, adaxiale dense brevi-papilloso, basi oblongo-bulbosus 0.5 mm longitudinis. Ovaria 1.7-2 mm longa elliptico-oblonga 10-tenui-nervata 5-angulato-costata glabra, apice obtusa cum annulo pappifero incrassato. Pappus albus 5-6 mm longus setis biseriatis strictissimis inaequilongis minute strigulosus acutisque.

Typus: Colombia, Cauca: Macizo Colombiano, Páramo de Las Papas, colinas SE de la Laguna La Magdalena, vert. rio Magdalena, 3350-3450 m, arbusto 2.5 m, hojas verdes negruscas brillantes haz ferruginosos envés, cabezuelas amarillentas, 12 Sept 1958, Idrobo, Pinto & Bischler 3250; holotypus COL.

Subspecies caucana differs from ssp. guadalupe by the elliptic shape and apparently entire margin of the leaves, by the more abundant and dense indument which covers branchlets, inflorescences and the abaxial side of the leaves, and by the naked receptacles. In S. guadalupe the leaf-lamina is deeply crenate-dentate and usually truncate at base, the indument does not cover the shining costa beneath and the branches are becoming glabrate. In addition in ssp. guadalupe the ramenta are narrower, longer and firmer and the receptacles are fimbriate.

PENTACALIA FREEMANII (Britt. & Greenm.) Cuatr. comb. nov.

Senecio freemanii Britton & Greenman. Ann. Mo. Bot. Gard. 8:92, pl. 2. 1921. Type: Britton, Hazen & Mendelson 1292, Trinidad.

PENTACALIA DESIDERABILIS (Velloso) Cuatr. comb. nov.

Senecio desiderabilis Velloso, Flora Fluminensis, Icones VIII t. 108, 1827, (1831). Archivos do Museu Nacional Rio Jan. 5:334.1881.

Senecio ellipticus DeCand. Prodr. 6:420. 1837. Cabrera, El Genero Senecio en Brasil, etc. Arquivos Jard. Bot. Rio Jan. 15:198. 1957.

LASIOCEPHALUS MOJANDENSIS (Hieron.) Cuatr. comb. nov.

Senecio mojandensis Hieron. ex. Sodiro Engl. Bot. Jahrb. 29:67.1900.

Senecio cayambensis Cuatr. Fedd. Repert. 55:135. 1953.

GYNOXYS RIMACHIANA Cuatr. sp. nov.

Arbuscula ad 10 m alta. Folia alterna chartacea rigidiuscula in sicco tabacina longe petiolata. Lamina 14-19 x 7-10.5 cm ovata ad apicem attenuata subacutata basi obtusa vel subrotundata margine plana laevis sinuata dentibus callosis minutissimis repandis munita; adaxiale sublaevis, costa signata et nervis lateralibus

parum notatis plus minusve stellato-pilosis, reliqua superficie tantum sparsis vel raris pilis minutis stellatis albis vel ochroleucis praedita; abaxiale costa prominenti striolata, nervis secundaris circa 7 utroque latere angustis sed prominentibus patulis et curvato-ascendentibus prope marginem arcuato-anastomosantibus, nervis tertiis transversis minus prominentibus teneris cum venulis minoribus in reticulum laxum anastomosatis; costa et nervis principalibus dense reliqua superficie copiose pilosa pilis stellatis parvis vel minutis sessilibus vel breviter pediculatis radiis subuniformibus vel inaequalibus, crassiusculis vel teneris, plerumque intricatis. Petiolus 4.5-6 cm longus argute striatus densiuscule stellato-pilosus, basi leviter ampliatus.

Inflorescentiae terminales floribundae sub-corymbiforme paniculatae circa 20 cm longa et ampla (in specimine). Axis robustus. Rami inferiores 22-15 cm longi dimidia parte superiori corymbosoramosa, sicut ramuli teneri sed rigidi erecti vel ascendentes striolati, copiose stellato-pilosi. Pedicelli graciles erecti vel inclinati 4-12 mm longi pilosiusculi.

Capitula radiata cylindracea circa 7-8 mm longa. Involucrum campanulatum viride 4-5.5 mm altum quam floribus brevius, 8 phyllariis 4.4-4.8 mm longis, exterioribus 1 mm latis oblongis apice paulo attenuatis crassiusculis deorsum magis incrassatis, interioribus 1.6-1.8 mm latis membranaceis sed linea media carnosa crassaque et circa basim crassiori, elliptico-oblongis, omnibus ad marginem circa apicem eroso-ciliatis reliquis glabris. Calyculus 2-3 bracteis linearibus acutis 1-2.5 (-3) mm longis 0.3 mm latis.

Flores radii feminei ligulati tantum duo in capitulo. Corolla lutea 10 mm longa glaberrima, tubo 3.6-4 mm longo angusto, lamina elliptico-oblonga 1.7-2 mm lata 4-5 nervata apice subite angustata minute tridentata apicibus dentium minute crasseque papillois, adaxiale minute mamillato-papillosa. Stylus circa 6 mm longus, ramis 2 mm recurvatis adaxiale duobus lineis stigmaticis crassis parallele conniventibus apicibus conicis papilloso-coronatis et longe caudatis, pilis lanceolatis ad circa 0.5 mm. Ovarium 1.8-2 mm longum, oblongum plus minusve conspicue 5-angulatum apice annulare dilatatum. Pappus circiter 4 mm longus stramineus setis biseriatis inaequalibus 1-4(-4.5) mm longis acutis scabris basi coalitis; annulus extus minute obtuseque papillosus.

Flores disci hermaphroditi 7-9 plerumque 8 in capitulo. Corolla lutea tubulosa 6.5-7 mm longa glabra tubulo 2.8-3.2 mm crassiusculo limbo tubuloso 3.5-3.8 mm longo argute lobato lobis linearibus 1.5-1.8 mm longis tenuiter uninervatis, apicibus minute crasseque papillois. Antherae 3 mm longis basi breviter acuteque auriculatae appendicibus apicalibus ovato-oblongis 0.7 mm longis, endothecio-cellulis subquadrangularibus parvis nodulis in transversis parietibus; collum cylindraceum vix incrassatum. Stylus ramis elongatis maturitate recurvis adaxiale lineis stigmaticis duobus, crassis parallele conniventibus, apice conico copiosis papillis ad 0.4 mm longis coronato centro caudato pilis lanceolatis erectis ad 0.7 mm. Ovarium 1.8-2 mm longum oblongum 5-angulatum. Pappus et achaenia illa radii similia.

Typus: Peru, Huánuco, Dto. Chinchao, highway Tingo Maria-Huánuco,

El Mirador near Carpish, 2600-2700 m, rocky clay soil, tree 10 m, corolla yellow, 21 Mar 1980, Manuel Rimachi 4908; holotype, US.

G. rimachiana is a well defined species that fits into the section *Praegynoxys* Cuatr., characterized by having the floral and habit features of *Gynoxys*, except the alternate disposition of the leaves. The stellate hairs, characteristic of this species, are found also in some other unrelated *Gynoxys* and *Pentacalia* species being an uncommon feature. Nevertheless the stellate trichomes seems to be not sufficiently basic to support a generic or subgeneric rank for any group at the time being.

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MISCELLANEOUS NOTES ON NEOTROPICAL FLORA, XV. NEW TAXA IN THE ASTEREEAE.

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BACCHARIS KINGII Cuatr. sp. nov.

Frutex usque ad 1-1.5 m altus profuse ramosus ramis griseis striatis divaricatis, ramulis ascendentibus argute striatis glabris glanduloso-viscosis. Folia lineri-lanceolata sessilia utrinque angustata acutaque vulgo 10-22 mm longa 0.6-1.8 mm lata conspicuissime trinervata copiosissime glanduloso-punctata.

Capitula in pseudopaniculis cymosis brevibus terminalibus, ramulis alternis subpatentibus cymas 3-2 capitulis ferentibus vel monocephalis. Pedunculi teneri sed rigidi striolati glabri ad 1 cm longi vel capitulis subsesilibus tribus vel duobus glomeratis ad terminaciones ramulorum. Bractea subtendentes lineares folia similes sed breviores 7-2 x 1-0.2 mm.

Capitula mascula per anthesin corollis involucrem excedentibus subglobosa 6-6.5 mm alta 4-5 mm lata, 22-40 flores ferentia Involucrem ante et per anthesin in vivo phyllariis adpresse imbricatis ellipsoideum basi cuneata 5 x 3 mm, in sicco phyllariis leviter squarrosis conico-campanulatum 5 x 4-4.5 mm. Phyllaria gradatim imbricata 7-8 seriata; interiora fertilia vix exserta 3-2.3 x 0.5 mm lineari-lanceolata acutiuscula scariosa straminea abaxiale linea